

THE MANAGER

FORAGE MANAGEMENT

By Larry Chase and Tom Overton

Identifying, understanding the impact of, and using strategies to lower the impact of molds and mycotoxins in the dairy herd

Identifying and dealing with molds and mycotoxins in feeds

Given the high degree of variability of the 2011 forage growing season, we anticipate that mold and mycotoxin issues may be present in many areas. The presence of molds and mycotoxins in feeds is a cause of concern for dairy and livestock producers as animal health, performance, and reproduction can be impacted. Of course, many of the animal signs of a mold or mycotoxin problem can be associated with a number of other herd problems or management issues, so one must be careful to not blame mycotoxin issues for another problem on the dairy.

What are the risk factors for molds and mycotoxins, especially in corn production? According to Dr. Gary Bergstrom, Professor in Plant Pathology at Cornell, the greatest mycotoxin risk factors are:

- moist weather at silk emergence
- drought or high temperatures during grain maturation
- insect or other damage to ears and stalks
- delayed maturation/delayed harvest
- contaminated storage structures
- failure to adequately dry grain or poor ventilation of dried grain storage
- failure to exclude air from high-moisture, anaerobic storage

In 2011, we had one or more of these risk factors in many regions of the Northeast and eastern US.

What do we know about the effects of molds and mycotoxins on dairy animals? Numerous limitations and gaps in the information exist. These include:

- Very little controlled research has been conducted with dairy cattle.
- The majority of the research trials use varying levels of one mycotoxin added to a “clean” ration to evaluate animal responses.
- In the field, it is highly likely that a number of mycotoxins may be present in the suspect feed.

Hundreds of mycotoxins exist in nature.

- The effects of mycotoxins on ruminants may be less severe than for monogastric animals.
- Partial degradation of mycotoxins in the rumen may occur.
- Naturally contaminated feeds may produce a more severe response than a “pure” mycotoxin.
- Field problems may be associated with lower mycotoxin levels than problem levels determined using a single mycotoxin.

What are the animal signs associated with mold or mycotoxin problems? The most common signs are listed below. It is important to remember that most of these signs are not specific only for molds and mycotoxins. The most common signs are:

- Reduced feed palatability or feed intake.
- Reduced milk production in lactating dairy cows.
- Reduced growth rates in replacement heifers.
- Increased incidence of metabolic disorders.
- Depressed immune system function.
- Lower body condition scores.
- Dull, rough hair coats.
- Increased incidence of digestive disorders (off-feed, etc.).
- More variable manure consistency. An increased incidence of loose manure or diarrhea may be observed.
- Cows may not respond well to veterinary treatments.

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FYI

■ Larry Chase is Professor of Animal Science at Cornell and Tom Overton is Associate Professor of Animal Science and Director, PRO-DAIRY at Cornell. Larry and Tom can be reached at lec7@cornell.edu and tro2@cornell.edu, respectively.

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Health and Nutrition Conference on April 3 in Syracuse, NY and on April 5 in West Lebanon, NH. Speakers and topics include Dr. Nina Von Keyserlingk from the University of British Columbia on “Cow Comfort Assessment”, Dr. Heather Dann from Miner Institute

on “Fresh Cow Nutrition and Management”, Dr. Bill Weiss from The Ohio State University on “New Research in Macro- and Micro-mineral Nutrition”, and Dr. Trevor Devries from the University of Guelph on “New Concepts in Feeding Dairy Heifers”. Visit the PRO-DAIRY website at www.ansci.cornell.edu/prodairy or the NEAFA website at www.northeastalliance.org for more information and registration information. □

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development, mycotoxins both in silages and grains, and abnormally fermented silages. As described in a separate article in this section, these can impact cow performance and health. We also anticipate that spoilage yeasts may also become an issue when silos start to warm up in the spring, which can contribute to milk fat issues.

7) Look for value buys in the ingredient marketplace – Much can be gained (and lost) through feed purchasing/contracting decisions. Software tools are now available to help identify which feeds are relatively better (or poorer) buys based upon their nutrient content and the value of these nutrients in the feed marketplace. These tools are not ration balancers, but they can help steer the discussion of which feeds to incorporate or to bring to the farm as separate commodities. One such tool is called Sesame, which was developed by Dr. Normand St. Pierre from The Ohio State University, and is available at www.sesamesoft.com. This program uses all available feeds in a given marketplace to calculate the value of energy

and nutrients (e.g., rumen degradable protein and digestible rumen undegradable protein) and then calculates predicted values of feeds for users to compare to actual market prices. If the predicted value is higher than the actual price, then the feed is a comparatively good buy. If the predicted value is lower than the actual price, then the feed is a relatively poor buy. Although the software program is available for purchase at the website above, we recommend that those interested in looking further at this consider subscribing, for a nominal fee, to a report of feed values by region that is compiled by Dr. Joanne Knapp from Fox Hollow Consulting. More information on this report is available at: http://www.foxhollowllc.com/FHC/Feed_Prices.html

In summary, 2012 is going to be a challenge for forage and nutrition programs for many herds, but there are strategies to work through them. Make sure to work with a nutritionist who can help sort through options and who also sees what is/is not working on other farms. Finally, be ready to go when it comes time to get the 2012 crops into the ground! □

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How do molds and mycotoxins cause these problems? There are 4 primary methods in ruminant animals. These are:

- Changes in nutrient content, absorption and metabolism of nutrients.
- Alteration of rumen microbial activity.
- Changes in endocrine/neuroendocrine function.
- Suppression of the immune system.

What strategies can be used to lower the impact of molds and mycotoxins in dairy herds? The following section assumes that other factors were checked and that molds and/or mycotoxins are still a suspected problem. Strategies include:

- Consider feeding less of the suspect feed. In some cases, it may be advisable to stop using this feed.
- Physically remove and discard any feeds with visible mold growth.
- If possible, don't use any of the suspect feed in rations for close-up dry cows or early lactation cows.
- Consider adding a mold inhibitor to the TMR (total mixed ration). These are usually acid-based preservatives. They will not decrease the molds or mycotoxins already present in the feed. However, they can slow or inhibit any additional mold growth from the time the feed is mixed until it is consumed.

■ Consider adding one of the commercial flow agents or feed additives that are marketed to help with mycotoxin problems.

- Data on their effectiveness is limited.
 - Many of these have only been tested against aflatoxin.
 - FDA does not approve the addition of these for mycotoxin control.
 - A large number of products are on the market.
 - It is difficult to predict which product will work in a specific situation – most, if not all, of them seem to work in at least some situations
 - You may need to try more than one product.
- If you do add a flow agent or other feed additive, feed it for 2 to 3 weeks. Changes in feed intake or manure consistency may be the first index that it is working.

How to determine if I have mycotoxin contamination of feeds?

- Most commercial forage testing laboratories have the capability to screen feeds for mycotoxins.
- Remember, hundreds of mycotoxins occur in nature, but most labs only screen for the most common ones.
- Be sure to follow the specific guidelines for sample collection and handling during shipping as improper handling of samples may give false results.
- For more information on sample collection and handling, consult your forage lab. General guidelines are available online at the PRO-DAIRY website: www.ansci.cornell.edu/prodairy. Select “Feed Fact Sheets and Worksheets.” □